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ABSTRACT

Because research had indicated that there is a correlation between older fathers and Down's Syndrome, this study attempted to generalize that knowledge to other genetically attributable cases of mental retardation. Fathers (N=222) who had institutionalized offspring labeled as mentally retarded and a comparison group of 248 fathers were analyzed. Data were analyzed through the technique of analysis of covariance. Findings indicated that there is no significant relationship between paternal age and mental retardation incidence rates while holding constant birth order, education, maternal age, parental age dispersion, and race. (Author/JDD)

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Title: "The Independent Effect of Paternal Age on the Incidence of Mental Retardation."

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Abstract: An incidence group of parents who had institutionalized offspring labeled mentally retarded and a comparison group were analyzed to test whether older fathers had a propensity to have mentally retarded offspring. Because research had indicated there is a correlation between older fathers and Down's Syndrome, this study was attempting to generalize that knowledge to other genetically attributable cases of mental retardation. Through a multiple regression statistical analysis predictor variables were held constant and the independent effect of father's age was tested. The study indicated there was no correlation between father's age and mental retardation.

INTRODUCTION

Are older fathers more likely to procreate offspring who are labeled mentally retarded? According to scientific wisdom, sperm production is an ongoing process, therefore older men are not at risk of providing degenerate genetic material. However, Abroms and Bennett (1981) reported a correlation between paternal age and Down's Syndrome. They postulated that the primordial germ cell which produces sperm dates to pre birth and if that cell is defective due to age, then the genetic material will be degenerate. If this is true in Down's Syndrome then some forms of mental retardation related to degenerate genetics should be suspect of all older fathers.

Other studies have indicated mixed results. The high correlation between father's age and mother's age concomitant with the strong independent effect of mother's

age made it difficult, with limited statistical techniques, to ascertain the independent effect of father's age. Penrose (1933) studied both the effects of mother's and father's age on Down's Syndrome. Penrose, using mean ages and a regression equation to keep father's age constant, reported only a correlation of mother's age to Down's Syndrome. Erickson (1979) utilizing Chi square found a modest correlation between father's age and Down's Syndrome. No research has been published on the effect of paternal age on other forms of mental retardation.

METHOD

For this study a comparison group (N = 248) and an incidence group (N = 222) were selected. The comparison group was a random sample of parents who could be compared to the incidence group. Data for the comparison group were extrapolated from the Mississippi Department of Statistical Records. Subjects for the incidence group were limited to those who resided at any one of Mississippi's Regional Residential Retardation Centers.

Individuals who met the following criteria were utilized as subjects in the incidence group: (a) the offspring must have been diagnosed as mentally retarded; (b) complete demographic data, as outlined by the variables in question (paternal age, maternal age, birth order, race, and educational level) must have been obtainable; and (c) the individual must previously or

presently have resided in one of Mississippi's Regional Residental Retardation Centers. After determination had been made pertaining to subjects who qualified for utilization in the study, demographic data were retrieved from the computerized data bank.

Since all of the incidence subjects who met the aforementioned criteria were utilized in the study, no provision for utilizing random selection was needed; however, the comparison group subjects were randomly selected. This comparison group was selected in the following manner. A random observation was chosen between the first and 1,431st records, and then every 1,431st record following was chosen until the total number of observations selected equaled 31. This was continued eight times for the years 1975-1985. The total number of randomly selected comparison group was 248 subjects.

Demographic data pertaining to age of parents at the time of subject's birth, age dispersion of parents, race, parents' occupation, birth order, and parents' education level were then collected.

Data were analyzed through the technique of analysis of covariance, which is a multiple regression procedure. This technique was used because it allowed the researcher to hold constant the strong independent effect of mother's age and other predictor variables while testing the independent effect of paternal age as a predictor of mental retardation.

The .01 level of statistical significance was used as the acceptance level for all tests of hypotheses. The Xerox Sigma Nine computer, utilizing program REGRAN, performed the calculations.

RESULTS

The findings of this study, as reported in Table 1, indicate there is no significant relationship between paternal age and mental retardation incidence rates. A nonsignificant ($p = .6528$) F ratio of .893 was reported between the criterion variable mental retardation and the predictor variable paternal age while holding constant birth order, education, maternal age, parental age dispersion, and race. An R^2 difference of .0016 indicates that the relationship between the two variables explained less than one percent of the original variance.

Table 1

Multiple Regression Model Reporting the Independent Relationship Between the Criterion Variable Mental Retardation and the Predictor Variable Paternal Age

Predictor Variable	R^2		df	F	P
Paternal Age	Full	.1568	1/457	.893	.6528
	Restricted	.1551			
	Difference	.0016			

Table 2 reveals a description of paternal age percentages for the comparison and incidence groups. In the incidence group it was noteworthy that 24.4% of the fathers were 35 years of age or older at the time of their child's birth, compared to 11.3% in the comparison group. The mean paternal age in the experimental group was approximately 2½ years greater than the mean age of fathers in the comparison group. Also two fathers in the incidence group were under age 15.

Table 2

Percentages for Paternal Age

Variable	Percentages	
	Comparison (N = 248)	Incidence (N = 222)
Paternal Age		
< 15	0	.9
15-19	4.4	4.1
20-24	30.6	25.7
25-29	34.3	27.5
30-34	19.4	17.6
35-39	8.5	9.0
40-49	2.0	10.4
50 +	.8	5.0

DISCUSSION

According to the results of this study older fathers do not have an abnormal propensity to have mentally retarded offspring. Older men are not at risk of providing degenerate genetic material. The correlation that Abroms and Bennett (1981) found between paternal age and Down's Syndrome cannot be generalized to other forms of mental retardation.

Father's age nor mother's age, at the time of the subject's birth, had a significant influence on incidence rates of mental retardation. The total variance attributed to the best linear combination of predictor variables accounted for only 16% of the original variance. The strongest predictor variable was father's education which accounted for 13% of the variance. This finding suggests that there must be other predictor variables that could be identified.

References

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